MATERIAL SAFETY DATA SHEET DPM 387

MILITARY AVIATION TURBINE FUEL JP-4

MSDS No. APPC 501

Rev. Date 07/26/83

ARCO PETROLEUM PRODUCTS COMPANY
DIVISION OF ATLANTIC RICHFIELD COMPANY
515 SOUTH FLOWER STREET
LOS ANGELES, CALIFORNIA 90071

Customer service

IMPORTANT: Read this MSDS before handling and disposing of this product and pass this information on to employees, customers, and users of this product

I. General

Trade Name	MILITARY AVIATION TURBINE FUEL JP-4
Other Names	JP-4 JET FUEL MIL-T-5624L, AMENDMENT 1 SPECIFICATION FUEL

Telephone Numbers
EMERGENCY
800/424-9300 CHEMTREC
312/210-3000 COMPANY
CUSTOMER SERVICE
213/486-8258 INFO ONLY

Chemical Family	PETROLEUM HYDROCARBONS
Generic Name	PETROLEUM DISTILLATE FUEL

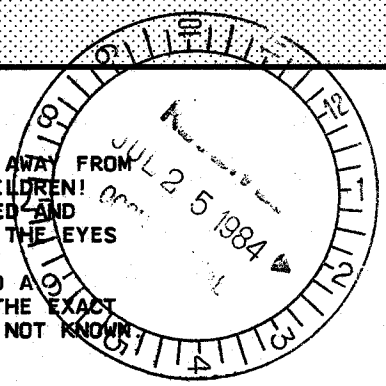
DOT Hazardous Materials Proper Shipping Name
FUEL, AVIATION, TURBINE ENGINE

DOT Hazard Class
FLAMMABLE LIQUID

CAS No.	**Company ID No.** 1027210272	**UN No.** UN 1863

II. Summary of Hazards

DANGER
EXTREMELY FLAMMABLE! OSHA/NFPA CLASS-IB FLAMMABLE LIQUID. KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAME! KEEP OUT OF REACH OF CHILDREN!
LIQUID AND VAPOR HARMFUL! LIQUID IS HARMFUL OR FATAL IF SWALLOWED AND IRRITATING TO EYES AND SKIN. VAPORS ARE IRRITATING TO THE EYES AND RESPIRATORY SYSTEM AND AFFECT THE NERVOUS SYSTEM.
INHALATION OF THE VAPORS OF AN ALKYLATE NAPHTHA STREAM SIMILAR TO A COMPONENT IN THIS PRODUCT PRODUCED KIDNEY DAMAGE IN MALE RATS. THE EXACT RELATIONSHIP BETWEEN THESE RESULTS AND POSSIBLE HUMAN EFFECTS IS NOT KNOWN.



III. Fire and Explosion

Flash Point (Method)	Autoignition Temperature (Method)	Flammable Limits (% Vol. in Air) At Normal Atmospheric Temperature and Pressure
AP 10° F (D-56)	AP 465° F (E-659)	Lower AP 1.3 Upper AP 8.0

Unusual Fire and Explosion Hazards	EXTREMELY FLAMMABLE! THIS MATERIAL RELEASES VAPORS AT OR BELOW AMBIENT TEMPERATURES. WHEN MIXED WITH AIR IN CERTAIN PROPORTIONS AND EXPOSED TO AN IGNITION SOURCE, THESE VAPORS CAN BURN IN THE OPEN OR EXPLODE IN CONFINED SPACES. BEING HEAVIER THAN AIR, FLAMMABLE VAPORS MAY TRAVEL LONG DISTANCES ALONG THE GROUND BEFORE REACHING A POINT OF IGNITION AND FLASHING BACK.
Extinguishing Media	FOAM, DRY CHEMICAL, AND WATER FOG OR SPRAY.
Special Firefighting Procedures	FOR FIRES INVOLVING THIS MATERIAL, DO NOT ENTER ANY ENCLOSED OR CONFINED FIRE SPACE WITHOUT PROPER PROTECTIVE EQUIPMENT. THIS MAY INCLUDE SELF-CONTAINED BREATHING APPARATUS TO PROTECT AGAINST THE HAZARDOUS EFFECTS OF COMBUSTION PRODUCTS AND OXYGEN DEFICIENCES. COOL TANKS AND CONTAINERS EXPOSED TO FIRE WITH WATER.

IV. Health Hazards

Primary Hazard	INHALATION OF VAPORS (SEE "EFFECTS OF OVEREXPOSURE" BOX BELOW). INGESTION OF LIQUID AND ASPIRATION INTO THE LUNGS MAY RESULT IN CHEMICAL PNEUMONIA.

ROUTE OF EXPOSURE	SIGNS AND SYMPTOMS
Inhalation	PROLONGED EXPOSURE MAY CAUSE SYMPTOMS OF CENTRAL NERVOUS SYSTEM DEPRESSION (DIZZINESS, INCOORDINATION, DROWSINESS, COMA, AND DEATH).
Eye Contact	EYE IRRITATION MAY RESULT FROM CONTACT WITH LIQUID, MISTS, AND/OR VAPORS.
Skin Absorption	LIQUID CAN PENETRATE SKIN TO CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION AND VAPOR PENETRATION CAN CAUSE SYSTEMIC EFFECTS.
Skin Irritation	SKIN IRRITATION LEADING TO DERMATITIS MAY RESULT FROM PROLONGED OR REPEATED SKIN CONTACT.
Ingestion	INGESTION: NAUSEA, VOMITING, DIARRHEA, RESTLESSNESS. ASPIRATION: CHEMICAL PNEUMONIA.
Effects Of Overexposure	EXPOSURE TO HIGH VAPOR LEVELS MAY CAUSE ASPHYXIATION. EYE IRRITATION, SKIN IRRITATION LEADING TO DERMATITIS, CENTRAL NERVOUS SYSTEM DEPRESSION, AND CHEMICAL PNEUMONIA ARE OTHER EFFECTS. PERSONS AFFECTED BY SYMPTOMS OF CENTRAL NERVOUS SYSTEM DEPRESSION WILL NORMALLY EXPERIENCE COMPLETE RECOVERY WHEN REMOVED FROM THE EXPOSURE AREA.

V. Protective Equipment

Respiratory	AN APPROVED ORGANIC VAPOR RESPIRATOR, SUPPLIED AIR, OR SELF-CONTAINED BREATHING APPARATUS (SCBA) MUST BE USED WHEN VAPOR CONCENTRATIONS EXCEED THE OCCUPATIONAL EXPOSURE LIMITS SHOWN IN SECTIONS VI. AND XI.
Ventilation	USE ADEQUATE VENTILATION TO KEEP VAPOR CONCENTRATIONS OF THIS MATERIAL BELOW THE OCCUPATIONAL EXPOSURE LIMITS SHOWN BELOW IN SECTION VI.
Eye	EYE PROTECTION (CHEMICAL-TYPE GOGGLES AND/OR FACE SHIELD) SHOULD BE WORN WHENEVER THERE IS A LIKELIHOOD OF SPLASHING OR SPRAYING LIQUID. CONTACT LENSES SHOULD NOT BE WORN. EYE WASH WATER SHOULD BE PROVIDED. *
Skin	AVOID PROLONGED OR REPEATED SKIN CONTACT. IF CONDITIONS OR FREQUENCY OF USE PRESENT DANGER OF EXPOSURE, CLEAN AND IMPERVIOUS PROTECTIVE CLOTHING SUCH AS GLOVES, APRON, BOOTS, AND FACIAL PROTECTION SHOULD BE WORN.
Other	USE GOOD PERSONAL HYGIENE PRACTICES. WASH HANDS BEFORE EATING, DRINKING, SMOKING, OR USE OF TOILET FACILITIES. IMMEDIATELY REMOVE SOILED CLOTHING AND WASH THOROUGHLY BEFORE REUSE. DISCARD FUEL-SOAKED LEATHER GOODS.

VI. Occupational Exposure Limits

	Substance	Source	Date
1.	JP-4 JET FUEL (D.O.T. "CHRIS" DOCUMENT)	COAST GUARD	1978

Exposure Limit Value/Time	Short Term Limit/Time	Peak Limit
200 PPM / 8 HOURS	2500 MG/M3 / 60 MINUTES	NOT ESTABLISHED

	Substance	Source	Date
2.	GASOLINE (SEE SECTION XI.)	ACGIH	1983

Exposure Limit Value/Time	Short Term Limit/Time	Peak Limit
300 PPM / 8 HOURS	500 PPM / 15 MINUTES	NOT ESTABLISHED

VII. Emergency and First Aid

Inhalation	IMMEDIATELY REMOVE FROM CONTAMINATED AREA TO FRESH AIR. FOR RESPIRATORY DISTRESS, GIVE OXYGEN OR ADMINISTER CPR (CARDIOPULMONARY RESUSCITATION), IF NECESSARY. MUST OBTAIN PROMPT MEDICAL ATTENTION.
Eye Contact	FLUSH WITH CLEAN LOW-PRESSURE WATER FOR AT LEAST 15 MINUTES. IF IRRITATION PERSISTS, OBTAIN MEDICAL ATTENTION.
Skin Contact	IMMEDIATELY REMOVE CONTAMINATED CLOTHING. WASH AFFECTED AREA THOROUGHLY WITH SOAP AND WATER. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION. WASH CLOTHING THOROUGHLY BEFORE REUSE, BUT DISCARD CONTAMINATED LEATHER GOODS.
Ingestion	DO NOT INDUCE VOMITING, SINCE ASPIRATION INTO THE LUNGS WILL CAUSE CHEMICAL PNEUMONIA. MUST OBTAIN MEDICAL ATTENTION PROMPTLY.
Note to Physician	TOXIC SIGNS AND SYMPTOMS MAY FOLLOW LIQUID CONTACT WITH THE SKIN OVER LARGE AREAS OF THE BODY, INHALATION OF VAPORS, OR INGESTION.

VIII. Spill and Disposal

Precautions if Material is Spilled or Released	CONTAIN SPILL. REMOVE ALL IGNITION SOURCES AND SAFELY STOP FLOW OF SPILL. EVACUATE ALL NON-ESSENTIAL PERSONNEL. IN URBAN AREAS, CLEANUP ASAP; IN NATURAL ENVIRONMENTS, SEEK ADVICE FROM ECOLOGISTS. USE PROPER PROTECTIVE EQUIPMENT. BLANKET WITH FOAM OR USE WATER FOG TO DISPERSE VAPORS. PADS OR ABSORBANT MATERIALS CAN BE USED. THIS MATERIAL WILL FLOAT ON WATER AND RUN-OFF MAY CREATE AN EXPLOSION OR FIRE HAZARD. AVOID ENTRY INTO WATERBODIES. ALERT THE NATIONAL RESPONSE CENTER (800/424-8802) AND COMPLY WITH ALL LAWS. THE SPILL OR CONTAMINATED MATERIALS MAY BE HAZARDOUS TO ANIMAL/PLANT LIFE.
Waste Disposal Methods	MAXIMIZE PRODUCT RECOVERY FOR REUSE OR RECYCLING. UNUSED LIQUID PRODUCT IS LIKELY AN EPA "IGNITABLE HAZARDOUS WASTE" (D001). USE APPROVED TREATMENT, TRANSPORTERS, AND DISPOSAL SITES IN COMPLIANCE WITH ALL APPLICABLE LAWS. IF SPILL IS INTRODUCED INTO A WASTEWATER SYSTEM, THE CHEMICAL AND BIOLOGICAL OXYGEN DEMAND WILL LIKELY INCREASE. PROPERLY ACCLIMATE THE BIOMASS TO THE MATERIAL. POTENTIAL TREATMENT AND DISPOSAL METHODS INCLUDE LAND FARMING, INCINERATION AND LAND DISPOSAL, IF PERMITTED.

IX. Components

(This may not be a complete list of components)

Component Name	CAS No.		Composition amount (Wt.) (See Note on Page 4)
MIXTURE OF ADDITIVES (METAL DEACTIVATOR, ANTIOXIDANTS, ETC.)		LT	0.01 PERCENT
ETHYLENE GLYCOL MONOMETHYL ETHER (2-METHOXYETHANOL)	109-86-4	AP	0.10 TO 0.15 PERCENT
HEAVY STRAIGHT-RUN NAPHTHA (PETROLEUM)	64741-41-9*	AP	0 TO 100 PERCENT
FULL-RANGE ALKYLATE NAPHTHA (PETROLEUM)	64741-64-6*	AP	0 TO 60 PERCENT
LIGHT HYDROCRACKED DISTILLATE (PETROLEUM)	64741-77-1*	AP	0 TO 40 PERCENT
CLAY-TREATED DISTILLATE (PETROLEUM)	64742-38-7*	AP	0 TO 70 PERCENT
HYDRODESULFURIZED KEROSINE (PETROLEUM)	64742-81-0*	AP	0 TO 30 PERCENT

Compositions given are typical values, not specifications.

X. Physical and Chemical Data

Boiling Point 145° TO 518° F	**Evaporation Rate (Ratio of Time)** (BUTYL ACETATE = 1) GT 1		**Dry Point** N/AV
Freezing Point LT -72° F	**Vapor Pressure** (REID-PSIA AT 100° F) AP 2 TO 3		**Volatile Characteristics** APPRECIABLE
Specific Gravity (H_2O = 1 at 39.2° F) AP 0.75 TO 0.80	**Vapor Sp. Gr. (Air = 1.0 at 60° - 90° F)** AP 5	**Solubility in Water** NEGLIGIBLE	**Stability** STABLE
Hazardous Polymerization NOT EXPECTED TO OCCUR	**Viscosity Units, Temp., Method** N/AP		**pH** N/AP

Other Physical and Chemical Properties	SULFUR CONTENT = LT 0.4 WT.%; AROMATICS CONTENT = LT 25 VOL.%; OLEFINS CONTENT = LT 5 VOL.%.
Appearance and Odor	COLORLESS TO LIGHT AMBER-COLOR LIQUID; PETROLEUM NAPHTHA ODOR.
Conditions to Avoid	HEAT AND IGNITION SOURCES. DO NOT USE AS A CLEANING AGENT.
Materials to Avoid	STRONG ACIDS, ALKALIES, AND OXIDIZERS SUCH AS LIQUID CHLORINE AND OXYGEN.
Hazardous Decomposition Products	BURNING OR EXCESSIVE HEATING MAY PRODUCE CARBON MONOXIDE AND OTHER HARMFUL GASES/VAPORS INCLUDING OXIDES AND/OR OTHER COMPOUNDS OF SULFUR.

XI. Additional Precautions

Handling and Storage

SPECIAL SLOW LOAD PROCEDURES FOR "SWITCH LOADING" MUST BE FOLLOWED TO AVOID THE STATIC IGNITION HAZARD THAT CAN EXIST WHEN THIS MATERIAL IS LOADED INTO TANKS PREVIOUSLY CONTAINING GASOLINE OR OTHER LOW FLASH POINT HYDROCARBON PRODUCTS. (SEE A.P.I. PUBLICATION 2003.) VAPOR SPACES ABOVE THIS PRODUCT SHOULD ALWAYS BE ASSUMED TO BE IN THE FLAMMABLE RANGE. KEEP CONTAINERS CLOSED AND AWAY FROM HEAT AND IGNITION SOURCES! ALL ELECTRICAL EQUIPMENT IN AREAS WHERE MATERIAL IS STORED/HANDLED SHOULD BE INSTALLED IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE, N.F.P.A.

General Comments

SPECIFIC EXPOSURE CONTROL LIMITS FOR THIS PRODUCT HAVE NOT BEEN ESTABLISHED BY OSHA OR ACGIH; THE LIMITS SHOWN IN SECTION VI. AND HERE ARE SUGGESTED FOR INTERIM USE. (KEROSENE VAPOR EXPOSURE LIMIT SUGGESTED BY NIOSH (1977): 100 MG/M3 FOR 10 HOURS; 1800 MG/M3 FOR 15 MINUTES.)

EMPTY CONTAINERS RETAIN SOME LIQUID AND VAPOR RESIDUES; HAZARD PRECAUTIONS MUST BE OBSERVED WHEN HANDLING EMPTIES.

USE OF ANY HYDROCARBON FUEL IN SPACES WITHOUT ADEQUATE VENTILATION MAY RESULT IN GENERATION OF HAZARDOUS LEVELS OF VAPOR AND/OR INADEQUATE OXYGEN LEVELS FOR BREATHING.

SOME OF THE INFORMATION PRESENTED AND CONCLUSIONS DRAWN HEREIN ARE FROM SOURCES OTHER THAN DIRECT TEST DATA ON THE MIXTURE ITSELF.

- - - Note - - - Qualifications:

EQ = Equal	AP = Approximately	N/AV = Not Available
LT = Less Than	UK = Unkown	N/AP = Not Applicable
GT = Greater Than	TR = Trace	N/DA = No Data Available